
The Kilum-Ijim Forest Project: biodiversity monitoring in the montane forests of Cameroon

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La forêt de Kilum-Ijim est une importante aire pour les oiseaux, dans la province du Nordouest du Cameroun, et une partie des montagnes Camerounaise EBA. Quatre espèces qui sont considérées comme vulnérables par le BirdLife International viennent en ce lieu: *Tauraco bannermani*, *Platysteira (peltata) latincincta*, *Ploceus bannermani* et *Malaconotus gladiator*. Il ya également deux autres espèces qui sont prémenacées: *Andropadus montanus* et *Bradypterus (lopezi) banguaensis*. Les buts et résultats du projet concernant la forêt de Kilum-Ijim sont décrit ici.

Introduction

The Cameroon highlands

Data collected on different taxa demonstrate the Cameroon highlands to be of high biological importance¹⁰. The montane forests of this region are considered to be a priority area for conservation on a global scale and the area is classified as critical in a hierarchy of priority listings of global Endemic Bird Areas^{10,18}. The current Important Bird Areas (IBAs) criteria⁶, include the Cameroon mountains in the Afrotropical Highlands biome which corresponds closely with phytocorion VIII of White's *Vegetation of Africa*²¹, within which are found many species of global conservation concern.

Endemic Bird Areas and Important Bird Areas

Bird species with breeding ranges of less than 50,000 km² (restricted-range species) tend to occur on islands or in isolated patches of habitat such as montane forests¹⁰. The boundaries of areas with concentrations of restricted-range species have been delineated by BirdLife International, and the areas so defined called Endemic Bird Areas (EBAs)^{10,18}. The area of EBAs covers 2% of the earth's land surface, but contains the entire ranges of 20% of the world's bird species. Eighty-five percent of EBAs have one or more threatened or extinct restricted-range species¹⁸.

Using this approach, the Cameroon mountains were identified as a high priority for conservation. Twenty-seven bird species are confined to this EBA, the second highest of any EBA in Africa (after the Albertine Rift Mountains), and ten of these 27 species are listed as globally threatened¹⁸. Most EBAs vary in size from a few square kilometres to more than 100,000 km². In many cases it is not practical to address conservation efforts at the EBA as a whole. The aim of BirdLife's Important Bird Areas (IBA) programme is 'to identify and protect a network of sites at a biogeographic scale, critical for long-term viability of naturally occurring bird populations, across the range of those bird species for which a sites-based approach is appropriate'⁶. The IBA programme selects sites based on the presence of globally

threatened species, the presence of restricted-range species, the presence of an assemblage of species restricted to a particular biome, and the presence of congregations of waterbirds, seabirds or migratory species. Based on the application of these criteria, the Kilum-Ijim forest in the Cameroon mountains EBA has been identified as an Important Bird Area, because it is the only viable fragment remaining of the Bamenda Highlands section of this EBA (Table 1). Conservation of the Kilum-Ijim forest is critical for the survival of at least two bird species.

The Kilum-Ijim Forest Project

The Bamenda Highlands is an upland area within the NorthWest Province of Cameroon, and is recognised as a discrete biological unit by WWF²³. The Kilum-Ijim Forest is a relatively well-studied area within these highlands, and the largest remaining patch of montane forest in West Africa (Fig. 1). Since 1987, BirdLife International has been working to conserve this forest within the framework of the integrated conservation and development project—Kilum-Ijim Forest Project, formerly the Kilum Mountain Forest Project—and, subsequently, its sister project the Ijim Mountain Forest Project. The total area enclosed by the Kilum-Ijim forest boundary is 200 km², of which approximately half is montane forest and the rest degraded montane grassland, various types of scrubland, and a small area of Afro-subalpine grassland (of high conservation importance) at the summit of Mt. Oku (Mt. Kilum)^{5,12,13,16,19,20}. The area supports many endemic taxa, including mammals, birds, herpetofauna and plants^{1,2,8,9,22}.

The Kilum-Ijim Project overall *goal* is that: *representative areas of the Cameroon montane forest biome are conserved in the long term.*

The Project *purpose* is: *the biodiversity, extent, and ecological processes of the Kilum-Ijim Forest are maintained and the forest is used sustainably by the local communities.*

Toward these ends, our broad conservation goals are that:

1. The extent and quality of the montane habitats

for which the Kilum-Ijim Forest is of outstanding conservation interest are improved or maintained.

2. The key species important for ecological processes within each habitat, such as forest regeneration and food webs, are maintained.
3. Populations of rare species of Kilum-Ijim Forest are maintained, and, if appropriate, increased.

Of the 27 species of bird endemic to the Cameroon Mountains EBA, 15 (55%) are found in the Kilum-Ijim Forest¹⁸. Two are strictly endemic to the Bamenda Highlands: Bannerman's Turaco *Tauraco bannermani* and Banded (Black-throated) Wattle-Eye *Platysteira (pellata) laticincta*, for which the Kilum-Ijim forests are the last stronghold¹. One species, Green-breasted Bush-shrike *Malaconotus gladiator*, is very uncommon at the site and has only been recorded in 1984 and 1998⁸. These three species and Bannerman's Weaver *Ploceus bannermani* are listed as Vulnerable, and Cameroon (Montane) Greenbul *Andropodus montanus* and Cameroon Bracken (Evergreen-Forest) Warbler *Brudypterus (lopxi) bangwaensis* as Near-threatened on the list of globally threatened species¹⁹. The endemic bird species are listed in Table 1, with their degree of endemicity, Red Data category, and IBA listings^{18,19}. Finally, Lake Oku qualifies for IBA category A4 (congregations) for Little Grebe *Tachybaptus ruficollis*, as the 1% threshold for this species in Africa is 500 individuals². Up to 1,000 birds are regularly seen on the lake during the dry season¹².

Apart from the ornithological value of the site, the forest supports populations of mammals and amphibians of conservation importance. Six small mammal species are endemic to Mount Oku². Preuss's Guenon *Cercopithecus preussi* (Endangered)—a species of monkey endemic to the

Cameroon Highlands, Coopers' Mountain Squirrel *Paraxerus cooperi* (Vulnerable)—also endemic to the Cameroon Highlands, the Oku Clawed Toad *Xenopus* sp. (endemic to Lake Oku and nearby forest), and Steindachner's Puddle Frog *Phrynobatrachus steindachneri* (endemic to the Bamenda Highlands)^{8,9,22} all occur in the forest. Endemic plants include the strict endemics *Doryalis* sp. nov., (a newly discovered small tree), *Kniphofia reflexa* (Liliaceae), and at least two species of *Eriocaulon*, all of which are endemic to the Kilum-Ijim forest area and / or including sites a few kilometres from the forest boundary (unpubl. data).

Threats and solutions

The area is a remnant of the once extensive montane forest that, until relatively recently, covered the Bamenda Highlands and much of the Cameroon mountain chain. Most of this has now been cleared and converted to farm and grazing land. By 1986 the forest had been reduced to 50% of its 1963 extent^{5,13}. Kilum-Ijim forest is thus essentially an island of montane forest surrounded by a sea of cultivation; mainly maize, potatoes and beans. Tree species growing outside the forest boundary are mostly exotic fruit or timber trees such as avocado, eucalyptus and cypress.

The Kilum and Ijim Forest Projects were established to halt forest loss and help provide sustainable alternatives to forest clearance. Thus, the Project has been working to improve farmers' income by rural development techniques, so that the need to clear natural forest is removed. Programmes include encouraging native tree species planting in farms, improvement of crop yields by extension work on contour farming, improved crop varieties, fruit tree grafting etc. This has been extremely effective: the Kilum-

Ijim forest now has a boundary that has been agreed in collaboration with the surrounding communities, and conversion of forest to farmland ceased in 1992. In the future, it is envisaged that the forest will be managed by the local communities with technical advice and input from the Ministry of Environment and Forestry (MINEF). This is currently being facilitated by the Kilum-Ijim Forest Project. However, other serious human influences on montane forest are still active: forest fire, and the use of the forest for grazing animals, especially goats, which browse on regenerating trees. Other, more subtle human activities

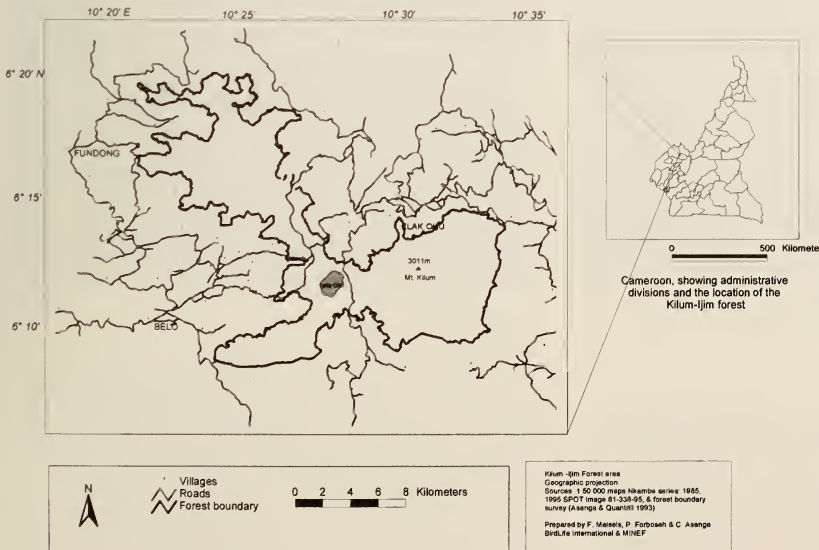


Figure 1. Cameroon, showing administrative divisions and the location of the Kilum-Ijim forest.

Table 1. Restricted-range bird species of the Kilum-Ijim Forests

The Cameroon Mountains EBA has a critical conservation priority¹⁶. The bird species which occur in the Kilum-Ijim forests and are endemic to this EBA are here ranked in order of overall conservation importance according to the following criteria.

Endemicity: BH: endemic to the Bamenda Highlands only. CA: Endemic to the Cameroon montane archipelago.

Degree of threat status in *Birds to Watch 2*⁹, (the IUCN listing), where VU = Vulnerable and NT = Near-Threatened. Lc = Least Concern.

IBA: which IBA categories does the species fall into? A1 = species of conservation concern; A2 = species of restricted range; A3 = biome restricted assemblage¹⁸.

KIFP is the proposed order of conservation importance of the various species.

Species	Endemicity	Degree of threat	IBA	KIFP
Bannerman's Turaco <i>Tauraco bannermani</i>	BH	VU*	A1, A2, A3	1
Banded (Black-throated) Wattle-Eye <i>Platysteira (peltata) laticincta</i>	BH	VU*	A1, A2, A3	1
Bannerman's Weaver <i>Ploceus bannermani</i>	CA	VU	A1, A2, A3	2
Green-breasted Bush-Shrike <i>Malaconotus gladiator</i>	CA	VU	A1, A2, A3	2
Cameroon (Montane) Greenbul <i>Andropadus montanus</i>	CA	NT	A1, A2, A3	3
Cameroon Bracken (Evergreen-Forest) Warbler <i>Bradypterus (lopezi) bangwaensis</i>	CA	NT	A1, A2, A3	3
Green Longtail <i>Urolais epichlora</i>	CA	Lc	A2, A3	4
Little Olive-back <i>Nesocharis shelleyi</i>	CA	Lc	A2, A3	4
Mountain Robin-Chat <i>Cossypha isabellae</i>	CA	Lc	A2, A3	4
Yellow-breasted Boubou <i>Laniarius atroflavus</i>	CA	Lc	A2, A3	4
Brown-backed (Chubb's) Cisticola <i>Cisticola (chubbi) discolor</i>	CA	Lc	A2, A3	4
Cameroon Olive Greenbul <i>Phyllastrephus poensis</i>	CA	Lc	A2, A3	4
Cameroon (Blue-headed) Sunbird <i>Nectarinia oritis</i>	CA	Lc	A2, A3	4
Cameroon Olive Pigeon <i>Columba sjostedti</i>	CA	Lc	A2, A3	4
Mountain Greenbul <i>Andropadus tephrolaemus</i>	CA	Lc	A2, A3	4

*It is probable that in the forthcoming *Birds to Watch 3*, both Bannerman's Turaco and Banded (Black-throated) Wattle-eye will be placed in the Endangered category.

are the selective removal of plant and animal species for food, medicine, carving and firewood. Some of the larger bodied (hunted) mammals have become locally extinct and most of the others are now extremely rare in the area. Some species of plant have been over-exploited and their populations drastically reduced.

Ecological monitoring

To follow these changes in biodiversity, and to provide information on the sustainability of the various forest uses, an ecological monitoring programme was commenced in 1994, the purpose of which was to provide information for the development and updating of the forest management plans, and to determine whether the conservation objectives of the project were being met. The major tree and bird species were monitored on a regular basis^{14,15}. The original programme has continued, with some modifications and additions¹⁷. Several components are measured: forest type / habitat structure; key animal indicators (principally birds); human impact on forest condition; and the overall extent of the different habitats. The programme investigates the forest on three scales.

The Bamenda Highlands landscape scale:

Very large-scale vegetation changes are monitored by regular analysis of satellite images, which also provide information concerning forest cover change over the Bamenda Highlands, outside the forest boundary.

The local landscape scale:

A system of photographic monitoring has been established, which follows changes in vegetation over areas that can be easily photographed from fixed points, at two-year intervals.

The individual species scale:

Essentially, much of the work is performed using a total of 150 permanent 20 x 20 m plots randomly placed within each major vegetation type. In half of these plots, trees are identified, measured and tagged, seedlings counted (to assess success of forest regeneration) and habitat structure assessed. In the other half, only trees of >10 cm dbh are measured and tagged, and the individual trees are not tagged, but mapped, so that forest users will not cease their normal activities. The measurements will be repeated at three-year intervals. Bird density has been regularly monitored in the known vegetation types (using highly skilled local field assistants, who identify and estimate the distance to calling and singing birds). Human activities are monitored by estimating density of signs such as snares, and debarked and felled trees.

Conclusions

Conservation of an important area of West African montane forest is at present assured by co-operation between BirdLife International, MINEF-Cameroon, the traditional authorities of the area, and the village communities using the forest for important forest-based resources such as water, fuelwood, and medicinal plants. This co-operation takes the form of facilitating Community Forest Management, rural development, and operating a biodiversity monitoring programme.



1



2



3



4



5



6

- 1. Banded Wattle-eye *Platysteira (peltata) laticincta* in the hand (BirdLife International)
- 2 & 3. Banded Wattle-eye *Platysteira (peltata) laticincta* at the first-ever nest to be discovered, Mt. Oku / Kilum, Cameroon (C. Parrot / BirdLife International)

- 4. Banded Wattle-eye *Platysteira (peltata) laticincta* (BirdLife International)
- 5. Bannerman's Turaco *Tauraco bannermani* (BirdLife International)
- 6. Bannerman's Turaco *Tauraco bannermani* on nest, Mt. Oku, Cameroon (Roger Fotoso / BirdLife International)

BirdLife intends to continue the monitoring programme long after the official Project closes (mid-year 2000), in order to remain informed about the results of community forest management on the long-term conservation of biodiversity of the forest.

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